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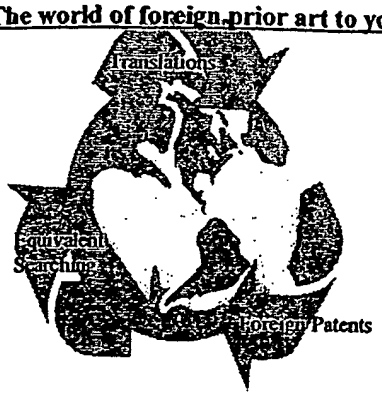

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(51) Int. Cl G06F 13/00
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G06T 3/40

(21) Application number: 08333384

(22) Date of filing: 13.12.96

(71) Applicant: HITACHI LTD

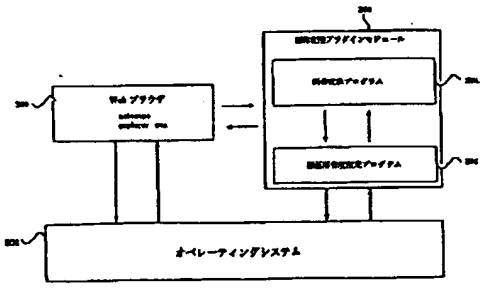
(72) Inventor: OKAYAMA MASAYA

(54) IMAGE TRANSFERRING METHOD

(57) Abstract:

PROBLEM TO BE SOLVED: To provide an image transferring method by which image data high in quality can be quickly transmitted to a user at a client side, and communication cost can be reduced.

SOLUTION: In this image transferring method for reducing a network load and transferring picture data when data high in resolution are necessary at a client side, data transferred to the client are converted into an optimized high resolution picture by using an image conversion plug-in module 308. In this case, a screen resolution setting program 306 is used for inspecting the resolution of the display device of the client. The result generated by the program 306 is transmitted to a picture conversion program 304. The transmitted data can be turned into the image high in quality and capable of being most easily viewed in a browser to which a reader is watched.



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	3/153	３３０		3/153	３３０Ａ
Ｇ０６Ｔ	3/40			15/66	３５５Ａ

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(71)出願人　000005108
株式会社日立製作所
東京都千代田区神田駿河台四丁目６番地

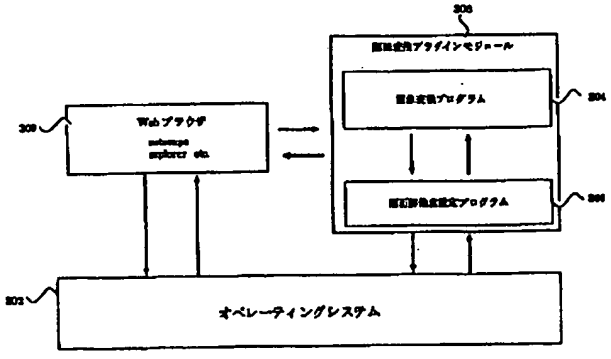
(72)発明者　岡山　将也
神奈川県横浜市都筑区加賀原二丁目２番
株式会社日立製作所ビジネスシステム開発
センタ内

(74)代理人　弁理士　小川　勝男

(54)【発明の名称】　画像転送方法

(57)【要約】
【課題】ネットワーク負荷を低減させることができないという課題があった。
【解決手段】クライアント側で高解像度のデータを必要とするときにネットワーク負荷を軽減させて画像データを転送する画像転送方法において、クライアントに転送されてきたデータを画像変換プラグインモジュール３０８を利用して、最適化された高解像度画像に変換する。このときクライアントのディスプレイ装置の解像度を検査するために、画面解像度設定プログラム３０６を利用する。３０６によって生成された結果は、画像変換プログラム３０４に送信される。送信されたデータは、読者が見ているブラウザで最も見やすい高品質な画像となる。

図３



【特許請求の範囲】
【請求項１】デジタル化された画像をサーバ側で補正をして高品質な画像にするのではなく、クライアント側で補正をして、クライアント側で高品質な画像を生成することを特徴とした画像転送方法。
【請求項２】請求項１において、クライアント側のディスプレイの解像度に最適な画像を生成できるように画像補正の調節を可能とすることを特徴とする画像転送方法。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明はインターネットに代表されるネットワーク上の画像転送方法に関し、特にクライアント側で高解像度のデータを必要とするときにネットワーク負荷を軽減させて画像データを転送する、画像転送方法に関する。
【０００２】
【従来の技術】画像情報をネットワーク、特にインターネットで送信し、クライアント側で表示するWorld Wide-Webにおいては、ユーザは世界中のインターネット上にある様々な画像情報にアクセスし、多種多様な高品質な画像を見ることができる。また、見ることができる画像は、静止画のような「絵および写真」だけでなく、ネットワークを通じて配送できる、動画等のデータも含まれる。
【０００３】これらのデータ(静止画および動画)をできるだけ早く送るために、画像の解像度を小さくし、かつアイコン等で選択させるようにして、そのアイコンが選択されたときにのみ、高品質の画像をユーザ(クライアント側)に転送する手段をとっている。
【０００４】また画像容量の多い情報に関しては、ftp等のファイル転送ツールを利用して、バッチファイル的にデータを転送させている。
【０００５】
【発明が解決しようとする課題】かかる従来の方法においては、次のような問題がある。
【０００６】すなわち、インターネットを用いて高品質な画像情報を転送する場合にはネットワーク全体の負荷の増大が問題となる。つまり、ダイヤルアップ接続や、パソコン通信などでネットワークに接続しているユーザは、回線速度の遅いネットワークを利用していることが多いためデータ容量の多い高品質な画像を見ようとすると時間が多くかかりかつコストが高くなる。
【０００７】また高品質な画像とはいっても、ユーザが利用するディスプレイ装置は、多種多様であり、サーバ側で一様に高品質にしても、そのすべての画像がクライアントのディスプレイで高品質に見れるとは限らない。すなわちサーバ側で一様に高品質にした画像が反対に見ずらいデータになりかねないということである。
【０００８】このような問題に対して、ＣＤ－ＲＯＭ等のネットワークを利用しない外部媒体を利用して、高品質なデータのやり取りを実現する方法や、サーバ側でデータ圧縮をして、データを転送する方法、さらにはデータ容量が小さいデータをインデックス的に表示しておき、その中から選択されたデータのみ、高品質なデータを送信するという方法がある。
【０００９】しかしこれらの方法でも、光ファイバーに代表される媒体等を利用する必要がある他、一般ユーザが利用しているインターネットのようなネットワーク上では、圧縮された画像の解凍をしなくてはならないため、リアルタイムで表示ができなくなる。
【００１０】このように従来の方法は、データ容量の多い高品質な画像データをサーバからクライアントに送信するときに、ネットワークの回線容量というハードウェアに依存してしまう問題があった。
【００１１】本発明の目的は、高品質な画像データを如何に早くクライアント側のユーザに送り、通信コストを下げることができる画像転送方法を提供することにある。
【００１２】本発明の他の目的は、高品質な画像データをクライアントのディスプレイに最適な解像度にして、ユーザに最も適した高品質な画像を見せることができる画像転送方法を提供することにある。
【００１３】
【課題を解決するための手段】本発明は、インターネットに代表されるネットワーク上で、デジタル化された画像をサーバ側で補正をして高品質な画像をクライアント側に転送するのではなく、補正していない画像をサーバから転送して、その補正されていない画像をクライアント側で補正をして、クライアント側で高品質な画像を生成することと、クライアント側のディスプレイの解像度に最適な画像を生成できるように画像補正の調節をクライアント側で可能とするものである。
【００１４】補正されていない画像とは、スキャナ、デジタルカメラ等々で入力されただけのデータのことを示し、かつJPEGもしくは、GIFファイルとして保存されたもののことをいう。インターネットにおいては、この二種類以外のフォーマットも転送することもできるが、World Wide-Web上では、上記の二種類しか、転送することができない。
【００１５】ディスプレイの解像度に最適な画像を生成するとは、製品として販売されている多種多様のディスプレイ装置がもっている独自の解像度に合わせた画像を生成することをいう。これは、解像度が低い(ある一定の長さにおいて、その中に存在する点(ドット)の数が少いものを解像度が低いという)ディスプレイに、高解像度用の画像補正をしても見ているユーザにとってみれば、逆に見にくくなってしまうという問題を引き起こしてしまう。
【００１６】

【発明の実施の形態】以下、本発明の実施の形態を一実施例を用いて説明する。

【００１７】図１は、本発明を適用した画像転送方法におけるシステム構成図である。

【００１８】図１において、１００は１０５のインターネット上に情報を提供する情報提供サーバである。ここで提供される情報の中には、画像データも含まれる。１０２、１０６、１１０は、ディスプレイ装置である。１０４は、インターネットとサーバとを接続するルータである。１０６は、利用者側のProxy(プロキシ)サーバである。プロキシサーバとは、代理サーバのことを示し、クライアント１１２から指示のあった情報を、その情報が存在するサーバから取得してクライアント１１２に転送するものである。１１１は、インターネットを利用するユーザが利用するコンピュータ本体である。１０１は、ＬＡＮ(ローカルエリアネットワーク)である。

【００１９】ここで示した構成は、一つの例にすぎず、他の構成の場合もありうる。クライアントとしては、パーソナルコンピュータでもかまわないし、ワークステーションでも構わないも考えられる。１０５のインターネットも電話回線を利用したもの、ＣＡＴＶを利用したもの、衛星通信を利用したものも考えられる。

【００２０】本実施例では、読者がサーバ１００に存在するある情報を読む(見る)場合、クライアント１１２からサーバ１０３に指示して情報(データ)をリアルタイムに送らせ、１０９のサーバを代理として、データを保管する。この保管のことをキャッシングという。このキャッシングされたデータをクライアント１１２が得ることで読者は、サーバ１００にある情報を得る(読むもしくは見る)ことが可能となる。

【００２１】図２は、サーバ１０３と代理サーバ１０９とのサーバ内部のブロック図である。

【００２２】２１４と２３６は、それぞれ、１０３と１０９とに対応している。クライアント１１２が代理サーバ２３６(１０９)にサーバ２１４(１０３)の情報を取って来る命令を実行すると、代理サーバ２３６は、２１４のディスク装置２０４からhtmlファイル２０５とそれに付随するgifファイル２０５およびjpegファイル２０６を転送し始める。この時の転送には、通信装置２１２を利用することで、２４０のインターネットに代表されるネットワークに送信され、２２６の通信装置を経由して代理サーバ２３６に転送される。これらの制御は、httpdと呼ばれるWeb用のサーバプログラム(情報提供サーバは、２０３ののプログラムであり、代理サーバ側は、２３０のプログラムを示す)がすべて制御している。転送されてきた画像データは、代理サーバ２３６内のディスク装置２３２にいったん保管される。ここに保管されたhtmlファイル２３３、画像データ２３４をクライアントに転送して、クライアント１１２が情報を得ることが可能となる。

【００２３】図３は、クライアント１１２内に保存されているソフトウェア(オペレーティングシステム３０２、ブラウザソフト３００、プラグインモジュール３０８)の関連図である。

【００２４】クライアント１１２に転送されてきたデータは、画像変換プラグインモジュール３０８を利用して、最適化された高解像度画像を生成する。このときクライアント１１２のディスプレイ装置１１０の解像度を検査するために、画面解像度設定プログラム３０６を利用する。３０６によって生成された結果は、画像変換プログラム３０４に送信される。送信されたデータは、読者が見ているブラウザで最も見やすい高品質な画像となる。なお画像変換プログラム３０４の部分は、「デジタルイメージシステム」(Digital Image System, HITACHI REVIEW, Aug 1995, pp.227-232)等の画像変換方法を利用する。

【００２５】次に、図４のフローチャートに基づいて、読者に提供する高品質および高解像度のデータ生成方法について説明する。

【００２６】まず送られて来た情報(データ)をクライアントが受け取った時、その中の画像部分が画像変換が必要かどうかをチェックする(ステップ４０１)。ここでNoと判断された場合は、そのままの画像をブラウザに表示させる。Yesと判断された場合には、(ステップ４０２)で画面解像度が設定されているかどうかをチェックする。もしここで設定されていれば、後述する画面解像度のデータテーブル５００を用いて、画像変換を行う(ステップ４０４)。もしされていなければ、解像度の設定を行い(ステップ４０３)、画像変換処理(ステップ４０４)を行って、クライアントのディスプレイ解像度に合わせた画像を生成する。

【００２７】図５は、画面解像度設定プログラム３０６によって設定されるデータテーブルである。データテーブル５００は、画像ごとに設定することが可能であるデータテーブルであり、画像の種類(現時点では、gifファイルとjpegファイルのみ)を指定する５１０、１インチあたり何ドットの点を描くかを決定する５０２、表示する画像の縦幅を決定する５０４、同じく横幅を決定する５０６といった４項目からなるデータテーブルである。

【００２８】

【発明の効果】以上に述べたように、本発明によれば、容量の多い高品質(高解像度)の画像をクライアント側のNetscape等のWebブラウザのプラグインがそれを代行することができるので、ネットワーク負荷をあげずに画像を送信することができる。またサーバ側で一様な解像度処理を行ってしまうと、クライアント側のディスプレイの解像度とうまく適合しなくなり、かえって見にくくなってしまうが、この発明を利用することで、読者は、自分の保持しているディスプレイにとって最も良い解像度で画像を見ることが可能となる。さらに情報提供サーバ

から少い容量でデータを転送できるので、通信コストを低減させることも可能になる。

【図面の簡単な説明】

【図１】本発明を適用した画像転送方法におけるシステム構成図

【図２】本発明を適用した画像処理のサーバと代理サーバとのブロック図

【図３】本発明を適用したWebブラウザとプラグインモジュールとのデータのやり取りを示した関連図

【図４】本発明を適用した画像転送における読者に提供する高品質画像の生成処理の一例を示すフローチャート

【図５】本発明を適用した画像解像度設定データテーブル図

【符号の説明】

１０４…ルータ、１０５…インターネット、１１２…ユーザ用クライアント、２１４…情報提供サーバ、２３６…プロキシサーバ、３０８…画像変換プラグインモジュール

【図１】

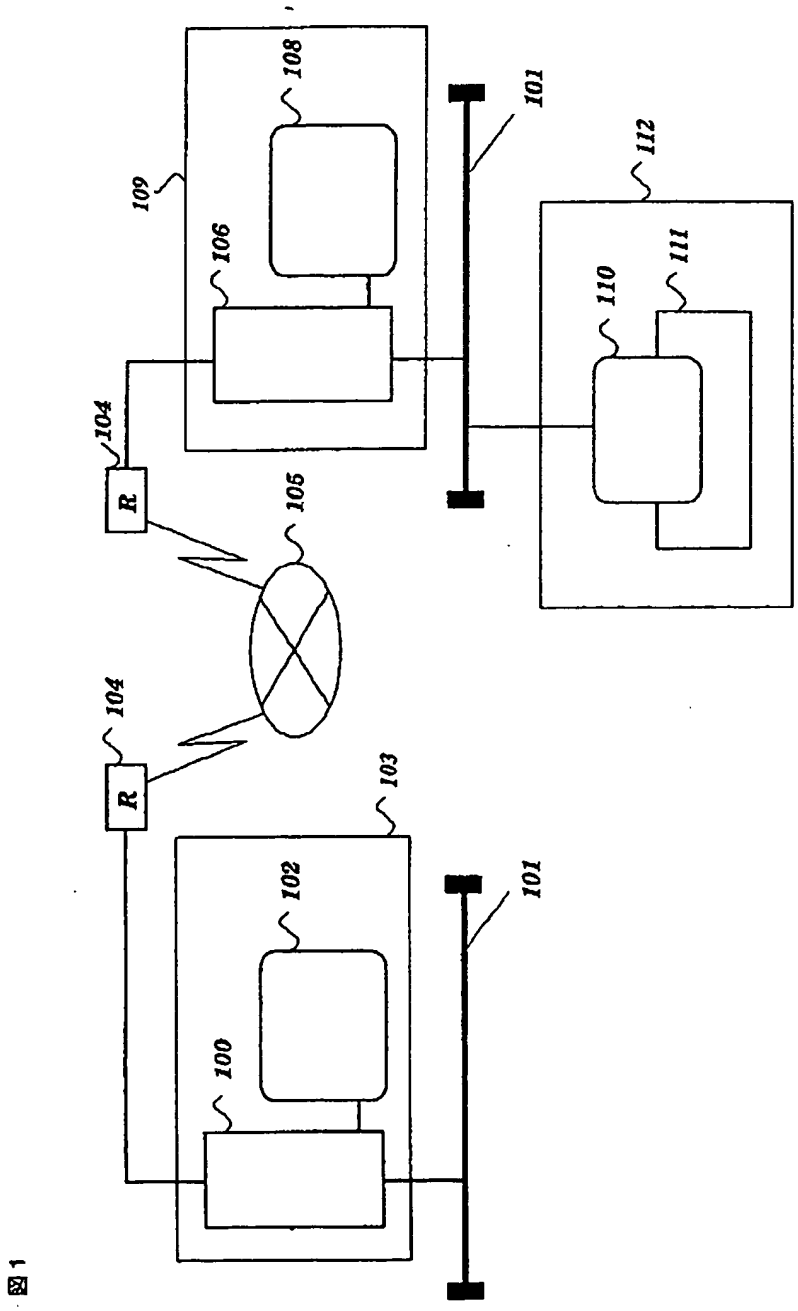


図１

【図2】

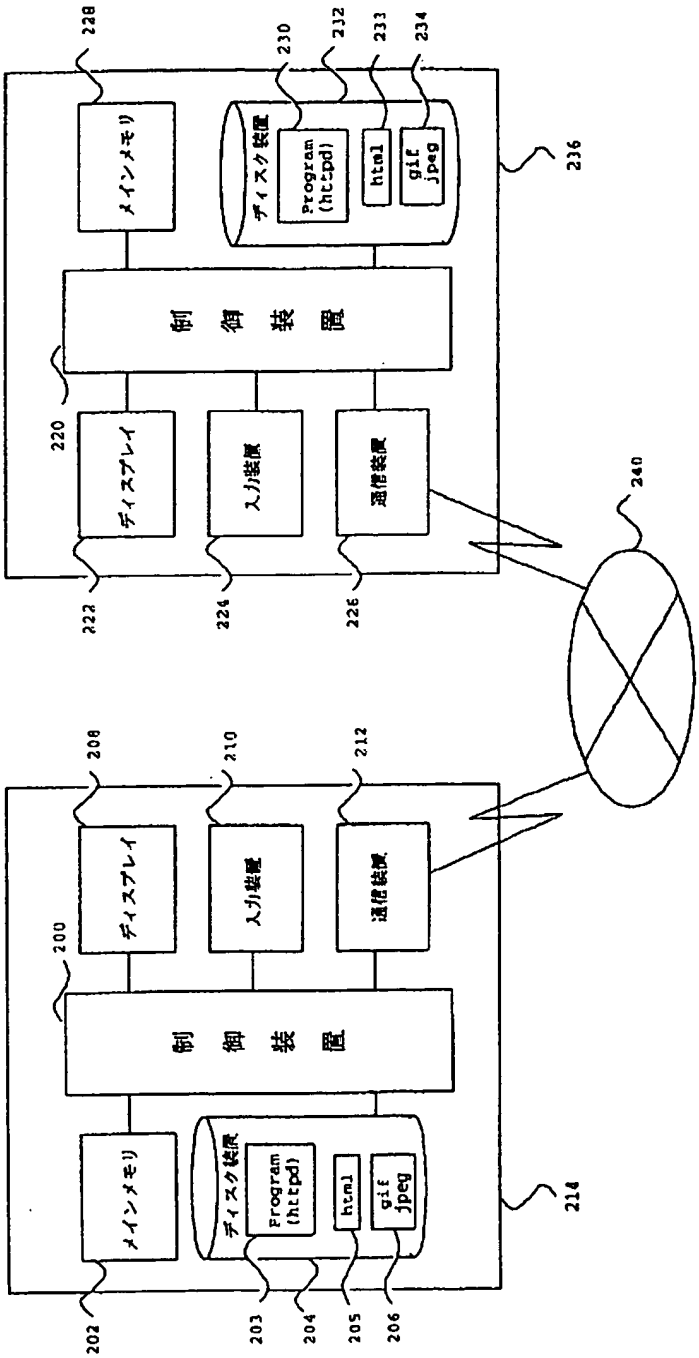
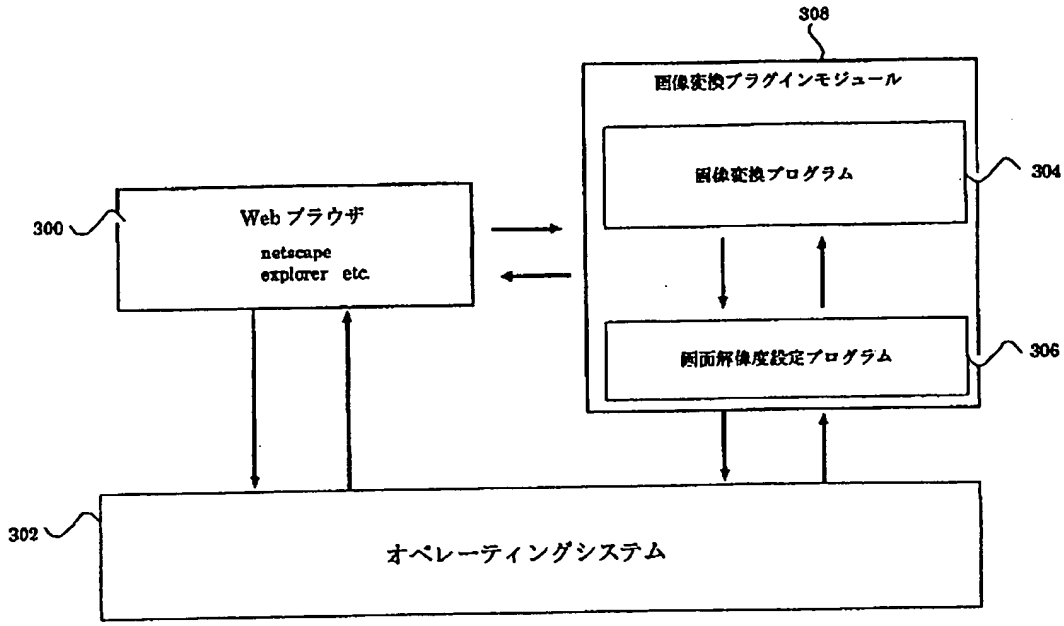

228
230
232
233
234
メインメモリ
ディスク装置
Program (httpd)
html
gif jpeg
236
制御装置
220
ディスプレイ
入力装置
通信装置
240
222
224
226
208
210
212
ディスプレイ
入力装置
通信装置
200
制御装置
メインメモリ
ディスク装置
Program (httpd)
html
gif jpeg
214
202
203
204
205
206

図2

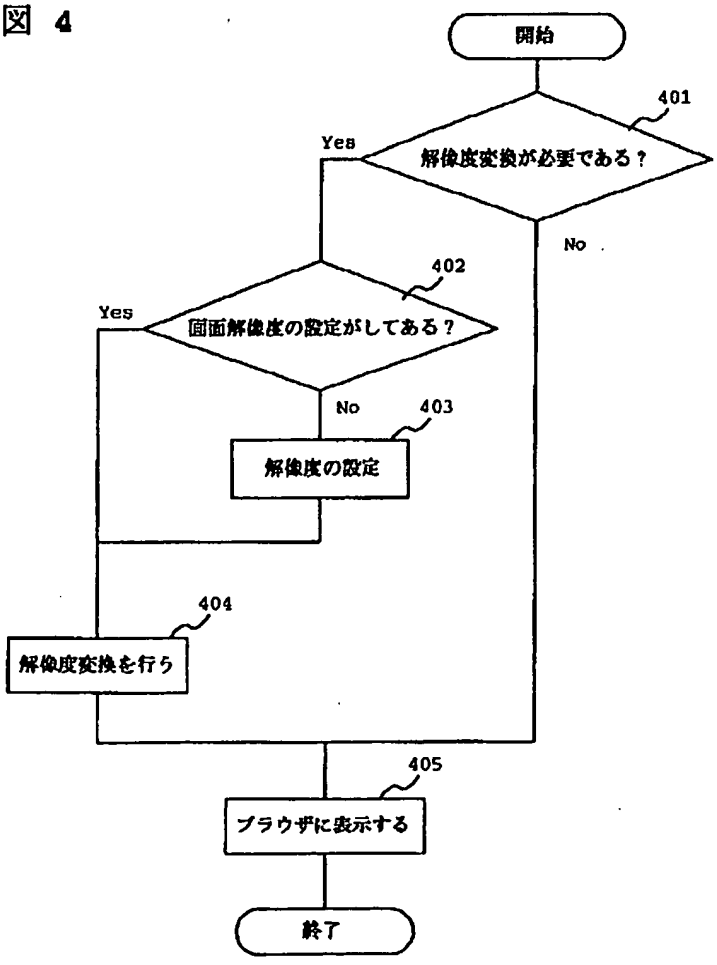
【図3】

図3



【図4】

図 4



【図5】

図5　500 画像解像度設定データテーブル

510 画像の種類	502 dpiサイズ	504 横 幅 (pixels)	506 縦 幅 (pixels)
gif	256	200	200
JPEG	360	400	360

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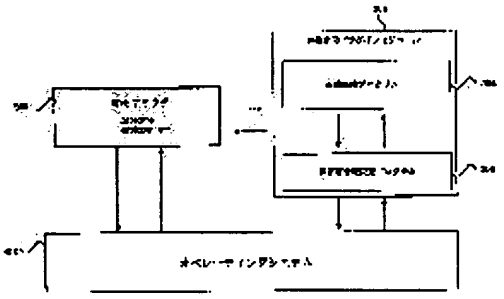
(71) Applicant : HITACHI LTD
(72) Inventor : OKAYAMA MASAYA

(54) IMAGE TRANSFERRING METHOD

(57) Abstract:
PROBLEM TO BE SOLVED: To provide an image transferring method by which image data high in quality can be quickly transmitted to a user at a client side, and communication cost can be reduced.
SOLUTION: In this image transferring method for reducing a network load and transferring picture data when data high in resolution are necessary at a client side, data transferred to the client are converted into an optimized high resolution picture by using an image conversion plug-in module 308. In this case, a screen resolution setting program 306 is used for inspecting the resolution of the display device of the client. The result generated by the program 306 is transmitted to a picture conversion program 304. The transmitted data can be turned into the image high in quality and capable of being most easily viewed in a browser to which a reader is watched.



LEGAL STATUS

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CLAIMS

[Claim(s)]
[Claim 1] The picture image transfer technique which rectified the digitized picture image by the server side, and did not make it a quality picture image, but was characterized by rectifying by the client side and generating a quality picture image by the client side.
[Claim 2] The picture image transfer technique characterized by enabling adjustment of picture image correction in a claim 1 so that the optimum picture image for the resolution of the display of a client side can be generated.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to the picture image transfer technique of making a network load mitigating and transmitting image data, when the data of a high resolution are needed especially by the client side about the picture image transfer technique on the network represented by internet.
[0002]
[Description of the Prior Art] Image information is transmitted by the network, especially internet, and in World Wide-Web displayed by the client side, an user can access various image information on the internet in the world, and can see various quality picture images. Moreover, not only "a picture and a photograph" whose picture image which can be seen is but the data with which it can deliver through a network, such as an animation, are contained. [like a still picture]
[0003] Only when the icon is chosen as resolution of a picture image was made small and it was made to choose by the icon etc. in order to send these data (a still picture and animation) early as much as possible, means to transmit a quality picture image to an user (client side) are taken.
[0004] Moreover, data are made to transmit in batch file about the information with much picture image capacity using file transfer tools, such as ftp.
[0005]
[Problem(s) to be Solved by the Invention] There are the following problems in such conventional technique.
[0006] That is, in transmitting quality image information using internet, increase of the load of the whole network poses a problem. That is, since dial-up connection and the user who has connected with a network by personal computer communications etc. use the late network of line speed in many cases, if it is going to see the quality picture image with much data capacity, time will be taken mostly and a cost will become high.
[0007] Moreover, even if the display unit which a quality picture image but a quality user use is various and it makes it quality uniformly by the server side, all those picture images cannot necessarily be seen with high quality on the display of a client. That is, I understand that the picture image uniformly made quality by the server side does not see on the contrary, but may become **** data, and there is.
[0008] To such a problem, using the external medium which does not use networks, such as CD-ROM, a data compression is carried out by the technique [of realizing an exchange of quality data], and server side, data capacity displays parvus data in index further, and only the technique of transmitting data, and the data chosen from them have a method of transmitting quality data.
[0009] However, it is necessary to use the medium represented by the optical fiber also by such technique and also, and on a network like the internet which the general user uses, since the compressed picture image must be thawed, a display becomes impossible on real time.
[0010] Thus, the conventional technique had a problem depending on hardware called the circuit capacity of a network, when transmitting the quality image data with much data capacity to a client from

a server.
[0011] The purpose of this invention sends quality image data to the user of a client side early how, and is to offer the picture image transfer technique which can lower a communication cost.
[0012] It is in other purposes of this invention making quality image data the optimum resolution for the display of a client, and offering the picture image transfer technique that the quality picture image which was most suitable for the user can be shown.
[0013]
[Means for Solving the Problem] On the network represented by internet, this invention rectifies the digitized picture image by the server side, and does not transmit a quality picture image to a client side. Transmit from a server the picture image which has not been rectified and the picture image which is not rectified is rectified by the client side. Adjustment of picture image correction is enabled at a client side so that the optimum picture image for the resolution of generating a quality picture image by the client side and the display of a client side can be generated.
[0014] Although the picture image which is not rectified shows the thing of only the data inputted by **s, such as a scanner and a digital camera, and was saved as JPEG or a GIF file, it means things. In internet, although the format of those other than this two kind can also be transmitted, only the two above-mentioned kinds can be transmitted on World Wide-Web.
[0015] It says generating the picture image doubled with the original resolution which a variety of display units currently sold as a product as generating the optimum picture image for the resolution of a display have. This will cause the problem will become hard to see conversely, if it sees for the user who is seeing even if it carries out the picture image correction for high resolutions to the display with low (it is said that resolution is low in what has the few number of the points (dot) which exist in it in a certain fixed length) resolution.
[0016]
[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained using one example.
[0017] Drawing 1 is a system configuration view in the picture image transfer technique which applied this invention.
[0018] In drawing 1 , 100 is an information offer server which offers an information on the internet of 105. Image data is also contained in the information offered here. 102, 106, and 110 are display units. 104 is a router which connects internet and a server. 106 is Proxy (proxy) server by the side of a user. A proxy server shows the thing of a surrogate server, and the information which had designation from the client 112 is acquired from the server in which the information exists, and is transmitted to a client 112. 111 is a mainframe of a computer which the user using internet uses. 101 is LAN (Local Area Network).

[0019] It does not pass over the configuration shown here for one example, but it may also have the case of other configurations. as a client, a personal computer may be used -- carrying out -- a work station -- not mattering, either -- it is considered The internet of 105, and the thing using the telephone line, the thing using CATV and the thing using satellite communication are considered.
[0020] In this example, when a reader reads a certain information which exists in a server 100 (it sees), point from a client 112 to a server 103, an information (data) is made to send to real time, the server of 109 is considered as the surrogate, and data are saved. This archive is called cash advance. The thing of a reader for which the information in a server 100 is acquired (it sees or it reads) becomes possible by a client 112 obtaining this data by which the cash advance was carried out.
[0021] Drawing 2 is a block diagram inside [of a server 103 and the surrogate server 109] a server.
[0022] 214 and 236 correspond to 103 and 109, respectively. If a client 112 executes the instruction which takes the information on a server 214 (103) to the surrogate server 236 (109), the surrogate server 236 will begin to transmit the gif file 205 and the jpeg file 206 which accompany the html file 205 and it from the disk unit 204 of 214. By using a communication device 212 for the transfer at this time, it is transmitted to the network represented by the internet of 240, and is transmitted to the surrogate server 236 via the communication device of 226. All the server programs for Web (an information offer server

is the program of 203 **s, and a surrogate server side shows the program of 230) called httpd are controlling these controls. The transmitted image data is once saved by the disk unit 232 in the surrogate server 236. The html file 233 and the image data 234 which were saved here are transmitted to a client, and it enables a client 112 to acquire an information.

[0023] Drawing 3 is a related view of software (an operating system 302, the browser software 300, plug-in module 308) saved in the client 112.

[0024] The data transmitted to the client 112 generate the optimized high-resolution picture image using the image transformation plug-in module 308. In order to inspect the resolution of the display unit 110 of a client 112 at this time, the screen resolution setting program 306 is used. The result generated by 306 is transmitted to the image transformation program 304. The transmitted data serve as the most legible quality picture image at the browser which the reader is looking at. In addition, the fraction of the image transformation program 304 uses the image transformation technique, such as a "digital image system" (Digital Image System, HITACHI REVIEW, Aug 1995, and pp.227-232).

[0025] Next, based on the flow chart of drawing 4 , the high quality with which a reader is provided, and the data generation method of a high resolution are explained.

[0026] When a client receives the information (data) sent first, it is confirmed whether the picture image fraction in it is required for image transformation (step 401). When judged as No here, a picture image as it is is displayed on a browser. When judged as Yes, it is confirmed whether screen resolution is set up at (step 402). Supposing it is set up here, image transformation will be performed using the data table 500 of the screen resolution mentioned later (step 404). If not carried out, resolution is set up (step 403), image transformation processing (step 404) is performed, and the picture image doubled with the display resolution of a client is generated.

[0027] Drawing 5 is a data table set up by the screen resolution setting program 306. a data table 500 is a data table which can be set up for every picture image, and are 502 which determines the point of how many dots per 510 or inch of specifying the modality (this time -- gif file and jpeg file) of picture image is drawn, 504 which determines the dip of the picture image to display, and a data table which consists of four items of 506 which similarly determines breadth

[0028]

[Effect of the Invention] Since plug-in of Web browsers, such as Netscape of a client side, can execute it for the picture image of the high quality (high resolution) with much capacity by proxy according to this invention as stated above, a picture image can be transmitted, without raising a network load. Moreover, if uniform resolution processing is performed by the server side, although it will stop suiting with the resolution of the display of a client side well and it will become on the contrary hard to see, a reader becomes possible [seeing a picture image in the best resolution for the display which he holds] by using this invention. Since data can furthermore be transmitted by few capacity from an information offer server, it is also enabled to reduce a communication cost.

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Field

[The technical field to which invention belongs] this invention relates to the picture image transfer technique of making a network load mitigating and transmitting image data, when the data of a high resolution are needed especially by the client side about the picture image transfer technique on the network represented by internet.

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Technique

[Description of the Prior Art] Image information is transmitted by the network, especially internet, and in World Wide-Web displayed by the client side, an user can access various image information on the internet in the world, and can see various quality picture images. Moreover, not only "a picture and a photograph" whose picture image which can be seen is but the data with which it can deliver through a network, such as an animation, are contained. [like a still picture]
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Effect

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TECHNICAL PROBLEM

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MEANS

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The system configuration view in the picture image transfer technique which applied this invention
[Drawing 2] The block diagram of the server of an image processing and surrogate server which applied this invention
[Drawing 3] The related view having shown the exchange of the data of Web browser and the plug-in module which applied this invention
[Drawing 4] The flow chart which shows an example of generation processing of the quality picture image with which the reader in the picture image transfer which applied this invention is provided
[Drawing 5] The picture image resolution setting data table view which applied this invention
[Description of Notations]
104 [-- The client for users 214 / -- An information offer server, 236 / -- A proxy server, 308 / -- Image transformation plug-in module] -- A router, 105 -- Internet, 112

[Translation done.]